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February 6, 2007
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February 6, 2007

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Mail Stop Appeal Brief-Patents
Commissioner for Patents
P.O. Box 1450
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Re: Application No. 10/697,376
Filing Date: Oct. 30, 2003
Applicant: Christopher E. Schafer
Title: IMPROVED FLUID RETAINING
APPARATUS WITH BALL VALVE

Examiner: Craig Price
Art Unit: 3756

Dear Sir:

In response to the Notification of Non-Compliant Appeal Brief mailed February 1, 2007, please find enclosed an amended Appeal Brief. The amended brief includes an amended Summary of the Claimed Subject Matter under 37 C.F.R. section 41.37(c)(1)(v) and a corrected Claims Appendix under 37 C.F.R. section 41.37(c)(1)(viii). Applicant notes that under MPEP section 1205.03 (C)(1) the examiner may have provided a copy of the claims in the claim appendix. Because the examiner chose not to provide such a copy, Applicant must submit a full amended brief. (MPEP § 1205.03(C)(2)). It is believed that this amended brief is in compliance with the Patent rules and Applicant respectfully requests consideration of this brief.

Respectfully submitted,

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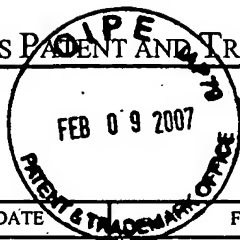
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

ART UNIT PAPER NUMBER

DATE MAILED: 02/01/2007

Please find below and/or attached an Office communication concerning this application or proceeding.

**Notification of Non-Compliant Appeal Brief
(37 CFR 41.37)**

Application No.

10/697,376

Applicant(s)

SCHAFER ET AL.

Examiner

Craig Price

Art Unit

3756

FEB 09 2007

--The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

The Appeal Brief filed on 11 December 2006 is defective for failure to comply with one or more provisions of 37 CFR 41.37.

To avoid dismissal of the appeal, applicant must file an amended brief or other appropriate correction (see MPEP 1205.03) within **ONE MONTH or THIRTY DAYS** from the mailing date of this Notification, whichever is longer. **EXTENSIONS OF THIS TIME PERIOD MAY BE GRANTED UNDER 37 CFR 1.136.**

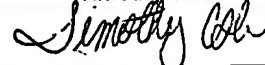
1. ☐ The brief does not contain the items required under 37 CFR 41.37(c), or the items are not under the proper heading or in the proper order.
2. ☐ The brief does not contain a statement of the status of all claims, (e.g., rejected, allowed, withdrawn, objected to, canceled), or does not identify the appealed claims (37 CFR 41.37(c)(1)(iii)).
3. ☐ At least one amendment has been filed subsequent to the final rejection, and the brief does not contain a statement of the status of each such amendment (37 CFR 41.37(c)(1)(iv)).
4. ☒ (a) The brief does not contain a concise explanation of the subject matter defined in each of the independent claims involved in the appeal, referring to the specification by page and line number and to the drawings, if any, by reference characters; and/or (b) the brief fails to: (1) identify, for each independent claim involved in the appeal and for each dependent claim argued separately, every means plus function and step plus function under 35 U.S.C. 112, sixth paragraph, and/or (2) set forth the structure, material, or acts described in the specification as corresponding to each claimed function with reference to the specification by page and line number, and to the drawings, if any, by reference characters (37 CFR 41.37(c)(1)(v)).
5. ☐ The brief does not contain a concise statement of each ground of rejection presented for review (37 CFR 41.37(c)(1)(vi)).
6. ☐ The brief does not present an argument under a separate heading for each ground of rejection on appeal (37 CFR 41.37(c)(1)(vii)).
7. ☒ The brief does not contain a correct copy of the appealed claims as an appendix thereto (37 CFR 41.37(c)(1)(viii)).
8. ☐ The brief does not contain copies of the evidence submitted under 37 CFR 1.130, 1.131, or 1.132 or of any other evidence entered by the examiner **and relied upon by appellant in the appeal**, along with a statement setting forth where in the record that evidence was entered by the examiner, as an appendix thereto (37 CFR 41.37(c)(1)(ix)).
9. ☐ The brief does not contain copies of the decisions rendered by a court or the Board in the proceeding identified in the Related Appeals and Interferences section of the brief as an appendix thereto (37 CFR 41.37(c)(1)(x)).
10. ☐ Other (including any explanation in support of the above items):

1.) The summary of claimed subject matter fails to map each independent claim to the specification by page and line number and to the drawings, if any.

2.) The claims appendix must contain a clean copy of the claims involved in the appeal. The copy should not include any markings such as brackets or underlines.

TIM COLE
PATENT APPEAL CENTER SPECIALIST

Timothy Cole





Grp./A.U.: 3753
Examiner: Craig James Price
Appeal No:

Mail Stop Appeal Brief-Patents
Commissioner for Patents
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BRIEF OF APPELLANT (AMENDED)

This is an appeal from the final rejection of the Examiner dated March 23, 2006, rejecting Claims 1-4 and 6-14, all of the claims in this case. This Brief is accompanied by the requisite fee set forth in 37 C.F.R. section 41.20(b)(2).



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REAL PARTY IN INTEREST

The instant application has been assigned to Improved Mobility Inc. The assignment is located at Real/Frame 014659/0293 (Assignment Record, Ex. A). Improved Mobility Inc. now operates under the fictitious name Evergreen Health, Inc., located at 1637 280th Street, Adair, IA 50002. (Iowa Secretary of State Business Record, Ex. B).

RELATED APPEALS AND INTERFERENCES

None.

STATUS OF CLAIMS

The status of the claims as set out in the Claim Appendix is as follows:

claims 1-4 and 6-14 are rejected; and

claim 5 has been withdrawn.

STATUS OF AMENDMENTS

Applicant filed an amendment on May 26, 2006, in response to the Final Office Action dated March 23, 2006. The Examiner has acted upon the amendment, entered the amendment, and maintained a prior rejection of all claims. (Office Action, Ex. C, Aug. 9, 2006, at pg. 7, § 7). The May 26, 2006, amendment included a 37 CFR 1.132 declaration that was entered and considered by the Examiner. (Declaration of Christopher E. Schafer, hereinafter "Schafer Declaration", Ex. D). The Examiner considered Applicant's arguments submitted with the May 26, 2006, amendment, but determined the arguments moot in view of new ground(s) of rejection. (Office Action, Ex. C).

The claims as set out in the Appendix include the most recent amendments to the claims.

SUMMARY OF CLAIMED SUBJECT MATTER

Applicant's claim 1 claims an apparatus (10) for retaining fluid in a liquid delivery tube (20) (Application, pg. 1, lines 5-7). The apparatus (10) of claim 1 comprises a lower portion (11) having a ball valve (12) (Application, pg. 7, lines 4-6, Fig. 2). The ball valve (12) permits only unidirectional flow of fluids and includes a valve chamber (13) for housing a ball (22) and having an inlet end (14) and an outlet end (16) being spaced apart sufficiently so that said ball is longitudinally, reciprocally movable within the valve chamber (13) from a closed position at the inlet end (14) of the valve chamber (13) to an open position at the outlet end (16) of the valve chamber (13). (Application, pg. 8, lines 11-15, Fig. 2). The claimed apparatus (10) also includes an upper tubular portion (15) that has an outside diameter that is tapered to its terminus to facilitate insertion into a liquid delivery tube (20) (Application, pg. 7, lines 17-19, Figs. 1, 3). The claimed tubular portion (15) has an elongated, tapered passageway (17), (Application, pg. 7, Lines 21-23), that communicates with the outlet end (16) of the valve chamber (13) to convey fluid from the chamber (13) to the tube (20). (Application pg. 7, lines 6-8, Fig. 2). The claimed valve chamber inlet end (14) includes a valve seat (24) having sidewalls (28) that taper inwardly from the valve chamber (13), (Application, pg. 9, lines 5-6, Figs. 2, 2a), such that the diameter of the valve seat (24) is reduced toward the valve chamber inlet end (14) to prevent the ball (22) from becoming stuck therein (Application, pg. 9, lines 6-10).

The tapered passageway (17) of claim 1 serves to restrict the flow of liquid. (Application, pg. 8, Lines 3-7). The flow restriction reduces the risk of liquid entering the lungs of a user. (Application, pg. 8, Lines 7-8).

Claim 10 claims all of the elements and limitations of claim 1, but requires the apparatus (10) to have sufficient spacing between the inlet end (15) and the outlet end (16) of the valve chamber (13) so that a portion of the liquid in the delivery tube (20) is permitted to pass back through the apparatus (10) to reduce the amount of liquid in the tube. (Application, pg. 8, lines 20-23).

Claim 11 claims all of the elements and limitations of claim 1, but further limits the sidewall (28) tapering to an angle generally less than 21 degrees but greater than 15 degrees. (Application, pg. 9, Lines 6-11). Dependent claim 6 further limits the tapering of the sidewalls (28) to an angle less than 20.76 degrees but greater than 14.76 degrees. (Application, pg. 9, Lines 6-11). Dependent claim 14 further limits the sidewall (28) tapering to an angle less than 18 degrees but greater than 17 degrees. (Application, pg. 9, Lines 6-11).

GROUND OF REJECTION TO BE REVIEWED ON APPEAL

Whether claims 1-3, , 9-10, and 12 are unpatentable under 35 U.S.C. 102(b) over Woodward (U.S. Patent No. 4,070,237).

Whether claim 7 is unpatentable under 35 U.S.C. 102(b) over Woodward (U.S. Patent No. 4,070,237).

Whether claim 8 is unpatentable under 35 U.S.C. 102(b) over Woodward (U.S. Patent No. 4,070,237).

Whether claims 6 and 11 are unpatentable under 35 U.S.C. 103(a) over Woodward.

Whether claim 14 is unpatentable under 35 U.S.C. 103(a) over Woodward.

Whether claim 13 is unpatentable under 35 U.S.C. 103(a) over Woodward in view of Wright (U.S. Patent No. 3,773,256).

ARGUMENT

A. Rejection under 35 U.S.C. 102(b) over U.S. Patent No. 4,070,237 ("Woodward").

i. Claims 1-3, 7,9-10, and 12

Woodward is directed to an automatic valve for controlling the vacuum in an enclosed container, specifically for suction boxes used on paper making machines. (Woodward, Col. 1, lines 7-10). Although Woodward explicitly describes the use of a bleed valve (7) with air suction boxes, the description of Woodward provides that the bleed valve (7) "can be used in any fluid system that may be controlled by a constant bleed valve." (*Id.*, col. 5, lines 39-44). Gravity acts on a ball (18) of Woodward to force the ball (18) into the valve seat. (*Id.*, col. 3, lines 47-50; col. 3, lines 33-35). Woodward discloses "the tapering of the conical valve seat 16 will be sufficient to prevent jamming of the ball in the seat and in any case will be cut approximately a 50 degree included angle", i.e. a 25 degree angle per side of the cross section. (*Id.*, col. 4, lines 15-18).

A cross section of the bleed valve (7) of Woodward is shown in Figure 2A of Woodward. Woodward provides a bleed valve (7) (*Id.*, col. 3, lines 21-22) having internally tapering sides (16) that form a conical valve seat. (*Id.*, col. 3, lines 38-40). The bleed valve (7) of Woodward is designed to connect to an elbow 12, i.e. a pipe. A top cap (13) on the bleed valve (7) of Woodward is internally threaded to engage the external threads of pipe (12). (*Id.*, col. 3, lines 33-35). A passageway (29) in the valve (7) of Woodward includes rods (19) that help guide the ball (18) in the passageway (29) (*Id.*, col. 3, lines 47-50), and a rod (24) or fin that stops the ball from closing the passageway (29). (*Id.*, col. 4, lines 33-42). The ball (18) "is substantially stationary in

operation" as it is supported by a steady stream of clean air. (*Id.*, col. 5, lines 28-30).

Applicant believes that Woodward does not anticipate the invention as claimed in claim 1 or claims 2, 3, 7-10, and 12. Claim 1 claims an apparatus for retaining fluid in a liquid delivery tube. Woodward discloses a bleed valve for bleeding a consistent amount of air. (Woodward, col. 5, lines 6-8). Woodward does not disclose whether its apparatus can retain fluid. Applicant's claim 1(b) requires the upper tubular portion have "an outside diameter that is tapered to its terminus to facilitate insertion into a liquid delivery tube". Fig. 2 of the instant application meets the limitation of claim 1(b), and is copied below next to a copy of Fig. 2a of Woodward.

Fig. 2 Application

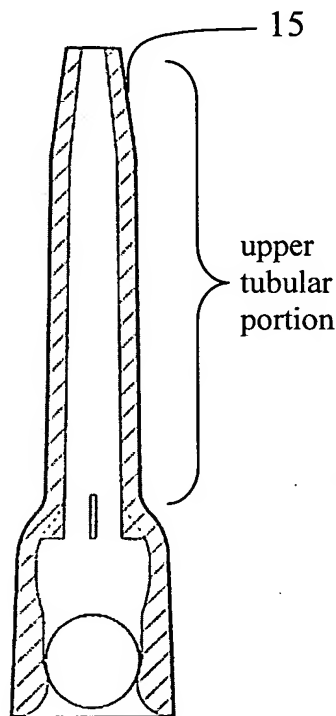
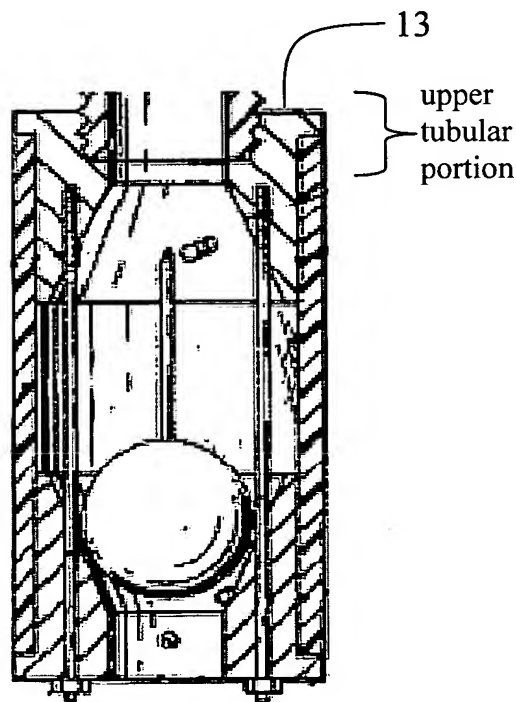


Fig. 2a Woodward



It is clear from the above figures that the upper tubular portion of Applicant's preferred embodiment is tapered to its terminus to facilitate insertion into a liquid delivery tube consistent with Applicant's claim 1(b). The apparatus disclosed in

Woodward, however, is internally threaded at its upper portion, i.e. cap (13), for insertion of a liquid delivery tube *into the apparatus*. In support of rejection, the Examiner identifies the chamfers on the corners of the cross section of the apparatus of Woodward in Figs. 3A and 3B. Nowhere in Woodward is there any description of the outside diameter of the upper portion of the bleed valve (7) or any indication that the outside diameter of the bleed valve (7) facilitates insertion into a liquid delivery tube. Applicant notes that drawings are for illustrative purposes only and are not accurate as to actual dimensions, but it appears that the chamfers shown in Figs. 3A and 3B of Woodward are much too slight to facilitate insertion into a liquid delivery tube and thereby fail to meet the limitations of claim element 1(b). Because Woodward does not disclose a tapering upper tubular portion that facilitates insertion into a liquid delivery tube, Woodward cannot anticipate claim 1 nor any of the claims dependent upon claim 1.

For the above reasons, it is believed that claims 1-3, 9-10, and 12 are patentable over Woodward.

ii. Claim 7

The Examiner rejected claim 7 based on Woodward's depiction that its upper tubular portion (22) tapers inwardly to restrict the flow of fluids. (Office Action, Ex. C, pg. 4, lines 11-14). Applicant disagrees that flow would be restricted by the upper portion (22) of Woodward. Looking at Figs. 2A, 3A, and 3B of Woodward, the inlet passage (17) of Woodward can be clearly seen as smaller than the outlet passage (21) of Woodward. Because the outlet passage (17) is larger than the inlet passage (21), flow cannot be further restricted by the upper portion (22) of Woodward. In contrast, Fig. 2 of the instant Application shows an upper tubular portion that tapers to reduce the

diameter of the outlet end to less than that of the inlet end and thus restrict the flow of fluids. For this reason, it is believed that claim 7 is patentable over Woodward.

iii. Claim 8

The Examiner rejected claim 8 based on Woodward's depiction that its upper tubular portion (22) is adjustable by trimming to increase the flow of fluid. (Office Action, Ex. C, pg. 4, lines 11-14). Applicant disagrees that flow could be increased by adjusting portion (22) of Woodward. Looking at Figs. 2A, 3A, and 3B of Woodward, the inlet passage (17) of Woodward can be clearly seen as smaller than the outlet passage (21) of Woodward). Because the outlet passage (17) is already larger than the inlet passage (21), flow cannot be increased by further widening the portion (22) through trimming.

Applicant further notes that trimming portion (22) of Woodward would effectively remove the chamfers identified by the Examiner. As shown in Fig. 3A and Fig. 3B of Woodward, the chamfers are at the upper edges of the bleed valve (7) of Woodward, above the portion (22). Trimming the portion (22) to increase its diameter would thus remove the chamfers, which the Examiner wrongly identifies as tapering that would allow insertion into a liquid delivery tube. The Examiner's rejection of claim 8 cannot stand because trimming the portion (22) would remove a claim element.

For the above reasons, it is believed that claim 8 is patentable over Woodward.

B. Rejection under 35 U.S.C. 103(a) over U.S. Patent No. 4,070,237 ("Woodward").

i. Claims 6, 11

The Examiner rejected claims 6, 11, and 14 as being unpatentable over Woodward (U.S. 4,070,237). Woodward discloses a ball valve with a valve seat having an included angle of approximately 50 degrees, i.e. 25 degrees per side. Claims 6 and

11 require the valve seat of the present invention to sidewalls that taper inwardly at an angle less than 20.76 degrees but greater than 14.76 degrees and generally less than 21 degrees but greater than generally 15 degrees. The Examiner contends that based on Woodward it would have been obvious to one having ordinary skill in the art at the time the present invention was made to have selected the angles in the claimed range (Office Action, Ex. C, at 6). The Examiner further states "such range overlaps or is *close enough* in range to the 25 degrees of Woodward, that selection would involve only routine skill in the art." (*Id.*)

Woodard is not in the same field of endeavor or analogous to the present invention. (See *In re Deminski*, 796 F.2d 436,442, 230 U.S.P.Q. 313, 315 (Fed. Cir. 1986). Woodward relates to the field of automatic bleed valves for controlling the vacuum of suction boxes (Woodward, col. 1, lines 6-10), Woodward further teaches that two-inch diameter ball is preferred, (Woodward, Col. 5, lines 10-23), but a ball of such diameter would be impracticable for use with a drinking apparatus. In particular, Woodward makes no suggestion of the problems faced by the Applicant, easing the effort of drinking through a liquid delivery tube, (Application, pg. 1, lines 6-7), *and* supporting a column of fluid at all times. (Application, pg. 7, lines 2-3). Woodard is therefore not reasonably pertinent to the specific problem of concern in the present invention. (See *In re Clay*, 966 F.2d 656, 23 U.S.P.Q.2d 1058, 1060-61 (Fed. Cir. 1992)).

Woodward's teaching of a valve seat with a taper of 25 degrees is not "close enough" to the range of the taper angles claimed in the instant application. In fact, there is no teaching or motivation provided in Woodward (or any other prior art provided by

the Examiner) to use a valve seat taper angle of less than 25° with ball valves for use with drinking apparatuses. Woodward explicitly teaches that "in any case" the valve seat "will be cut approximately a 50° included angle." (Woodward, col. 4, lines 16-17). Because of the limit of the teaching of the valve seat angle to a 50 degree included angle "in any case", Woodward does not motivate subsequent inventors to try any other valve seat angles, much less the angles claimed in Applicant's claims 6, 11, and 14. (See *In re Lindell*, 385 F.2d 453, 155 U.S.P.Q. 521, 523 (C.C.P.A. 1967) (rejection the "obvious to try" test); See *In re Kahn*, 441 F.3d 977, 986, 78 USPQ2d 1329, 1335 (Fed. Cir. 2006) (discussing rationale underlying the motivation-suggestion-teaching requirement as a guard against using hindsight in an obviousness analysis)).

The 25° angle disclosed by Woodward is considerable larger than the generally less than 21 degree angle upper limit claimed by Applicant. This difference of approximately 4 degrees is not "close enough" as the Examiner contends. As attested to in the Schafer Declaration of Ex. D, valve seat angles even a few degrees higher than the claimed range provided an unsatisfactory seal, (Schafer Declaration, Ex. D, ¶5) but angles less than the claimed range resulted in the ball tending to stick in the valve seat (Schafer Declaration, Ex. D, ¶7). Woodward itself discloses that the relationship of the ball size and orifice size depend upon the vacuum units, (Woodward, Col. 5, lines 10-23), and limits it claimed valve seat angle to a 50 degree included angle. (Woodward, col. 4, lines 16-17). As stated in the Schafer Declaration, Ex. D, the angle closest to the angle of Woodward that was tested was 23.76 degrees, and this angle provided an unsatisfactory seal. (Schafer Declaration, Ex. D, ¶5) For purposes of valve seats for use with drinking apparatuses, Woodward therefore teaches away from using

valve seat angles of less than 25° or even angles close to 25 degrees, such as 23.76 degrees.

It should be noted that Woodward is not directed toward providing a valve seat with a satisfactory seal that would be required for the ball valves used with drinking apparatuses. Woodward only directs "taper of the conical valve seat 16 will be sufficient to prevent jamming of the ball in the seat". (Woodward, col. 4, lines 14-16). Woodward explains that the ball (18) of Woodward "in effect floats on a column of air", (*Id.*, col. 4, lines 3-4). It is therefore apparent from the disclosure of Woodward that the only concern with the valve seat is prevention of "jamming" of the ball and that providing a satisfactory seal is of no concern. The inventor's Declaration of Ex. D. shows that as valve seat angles decrease, the valves have a better seal but the tendency of the ball to stick in the valve increases. (Schafer Declaration, Ex. D, ¶¶ 5,7). Woodward thus teaches away from the use of lower valve seat angles, as these decreased angles increase the likelihood of "jamming" of the ball in contravention of the purposes of Woodward.

For the above reasons, it is believed that claims 6 and 11 are patentable over Woodward.

ii. Claim 14

Claim 14 further limits the angle to generally less than 18 degrees and generally greater than 17 degrees. For the reasons stated in the above explanation of why Woodward does not make obvious the range of angles of claims 6, and 11, Applicant asserts that further limited range of angles claimed in claim 14 is not obvious in light of Woodward. An angle of 18 degrees is considerable less than 25 degrees for valve seat

sidewalls. As noted in the Schafer Declaration, Ex. D, the inventors experimented with angles including 17.76 degrees, 20.76, and 23.76 degrees. (Schafer Declaration, Ex. D, ¶4). The angle of 23.76 degrees had an unsatisfactory seal (Schafer Declaration, Ex. D, ¶5). The angle of 17.76 degrees was chosen over the greater angles because it provided the best seal of the higher range of angles. (Schafer Declaration, Ex. D, ¶8). The experiments of the inventors, as declared by inventor Christopher E. Schafer, show that a difference of just a few degrees in the angle of the sidewalls greatly affects whether the valve seat provides a satisfactory seal.

For the above reasons it is believed that claim 14 is patentable over Woodward.

C. Rejection of Claim 13 under 35 U.S.C. 103(a) over U.S. Patent No. 4,070,237 ("Woodward") in View of U.S. Patent No. 3,773,256 ("Wright").

The Examiner rejected claim 13 as being unpatentable over Woodward (U.S. 4,070,237) in view of Wright (U.S. 3,773,256). Wright discloses an apparatus to teach a child to use a drinking tube. (Wright, col. 1, lines 14-17). The feeding tube (14) of Wright includes a ball valve (30) having fingers (34) defining a cage for a ball (32). (Wright, col. 1, lines 56-58). The valve (30) of Wright is illustrated in Fig. 2 of Wright. The Examiner states that it would have been obvious to attach the apparatus of Wright onto the valve of Woodward. (Office Action, Ex. C, pg. 7, lines 9-13).

In making this rejection of Applicant's claim 13, the Examiner has failed to make a prima facie case of obviousness. The Examiner states no motivation to combine Woodward and Wright other than to note the combination of Woodward and Wright could "provide a means to assist a child in drinking from a straw". See *In re Kahn*, 441 F.3d at 986, 78 USPQ2d at 1335 (requiring motivation to combine references). Wright,

however, already states that it assists a child in drinking from a straw. (Wright, Col. 1, lines 14-17). Wright therefore provides no further motivation to use a different valve. Woodward is directed toward use with bleed valves, and it therefore cannot provide motivation for its combination with a drinking apparatus.

The combination of Wright and Woodward is further not obvious. Woodward and Wright were both registered in the 1970s, and in over twenty years, no one has combined these apparatuses. For the above reasons it is believed that claim 13 is patentable over Woodward in view of Wright.

D. Conclusion

The Examiner has rejected the instant application based primarily on the disclosure of Woodward. As explained in this Argument section, Woodward fails to disclose each and every element of claims 1, 7, and 8, and does not make obvious the valve seat angles of claims 6, 11, and 14. Applicant has subsequently traversed the Examiner's rejection. Applicant suggests that the application is in condition for allowance and respectfully requests that this Board direct the Examiner to issue a timely Notice of Allowance.

Respectfully submitted,

By: 

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ATTORNEYS FOR APPLICANT

CLAIMS APPENDIX

1. An apparatus for retaining fluid in a liquid delivery tube comprising

- a. A lower portion having a ball valve that permits only unidirectional flow of fluids and includes a valve chamber for housing a ball and having an inlet end and an outlet end being spaced apart sufficiently so that said ball is longitudinally, reciprocally movable within said chamber from a closed position at the inlet end of said chamber to an open position at the outlet end of said chamber;
- b. An upper tubular portion that has an outside diameter that is tapered to its terminus to facilitate insertion into a liquid delivery tube, said tubular portion having an elongated, tapered passageway that communicates with said outlet end of the valve chamber to convey fluid from said chamber to said tube; and
- c. said valve chamber inlet end includes a valve seat having sidewalls that taper inwardly from said valve chamber such that the diameter of said valve seat is reduced toward the valve chamber inlet end to prevent said ball from becoming stuck therein.

2. A fluid retaining apparatus as recited in claim 1, wherein at least one interior rib extends inward from an inside upper portion of the outlet of the valve chamber so that said ball cannot significantly obstruct the flow of fluids through the outlet of the valve chamber.

3. A fluid retaining apparatus as recited in claim 2, wherein the inside upper portion of the valve chamber includes a plurality of said interior ribs that are

circumferentially spaced apart.

4. A fluid retaining apparatus as recited in claim 3, wherein said plurality of said interior ribs are longitudinally aligned.

6. A fluid retaining apparatus as recited in claim 1, wherein said valve seat sidewalls taper inwardly at an angle less than 20.76° but greater than 14.76° .

7. A fluid retaining apparatus as recited in claim 1, wherein the diameter of the passageway of the upper tubular portion tapers inwardly so that the flow of fluid through the upper tubular portion is restricted.

8. A fluid retaining apparatus as recited in claim 7, wherein the diameter of the passageway of the upper tubular portion is adjustable by trimming to increase the flow of fluid through the apparatus.

9. A fluid retaining apparatus as recited in claim 1, wherein the upper tubular portion can be inserted into the bottom of said liquid delivery tube.

10. An apparatus for retaining fluid in a liquid delivery tube comprising

- a. A lower portion having a ball valve that permits only unidirectional flow of fluids and includes a valve chamber for housing a ball and having an inlet end and an outlet end being spaced apart sufficiently so that said ball is longitudinally, reciprocally movable within said chamber from a closed position at the inlet end of said chamber to an open position at the outlet end of said chamber;
- b. An upper tubular portion that has an outside diameter that is tapered so that it can be inserted into a liquid delivery tube, said tubular portion having an elongated, tapered passageway that communicates with said

outlet end of the valve chamber to convey fluid from said chamber to said tube; and

- c. Said valve chamber inlet end having a valve seat with sidewalls that taper inwardly from said valve chamber such that the diameter of said valve seat is reduced toward the valve chamber inlet end to prevent said ball from becoming stuck therein and there is sufficient spacing between said inlet end and said outlet end of said valve chamber so that a portion of the liquid in said delivery tube is permitted to pass back through said apparatus to reduce the amount of liquid in said tube.

11. An apparatus for retaining fluid in a liquid delivery tube comprising

- a. A lower portion having a ball valve that permits only unidirectional flow of fluids and includes a valve chamber for housing a ball and having an inlet end and an outlet end being spaced apart sufficiently so that said ball is longitudinally, reciprocally movable within said chamber from a closed position at the inlet end of said chamber to an open position at the outlet end of said chamber;
- b. An upper tubular portion that has an outside diameter that is tapered so that it can be inserted into a liquid delivery tube, said tubular portion having an elongated, tapered passageway that communicates with said outlet end of the valve chamber to convey fluid from said chamber to said tube; and
- c. Said valve chamber inlet end includes a valve seat having sidewalls that taper inwardly from said valve chamber at an angle less than generally 21

degrees but greater than generally 15 degrees to prevent said ball from becoming stuck therein.

12. A fluid retaining apparatus as recited in claim 1, wherein the spacing between said inlet end and said outlet end of said valve chamber is of a sufficient length so that as said ball moves from said open position to said closed position, a portion of the liquid in said delivery tube is permitted to pass back through said apparatus to reduce the amount of liquid in said tube.

13. A fluid retaining apparatus as recited in claim 12, wherein said liquid delivery tube is in the form of a straw having an upper end for delivering fluid to the mouth of a user and a bottom end to which said apparatus is attached.

14. A fluid retaining apparatus as recited in claim 6, wherein said valve seat sidewalls taper inwardly at an angle generally greater than 17 degrees but generally less than 18 degrees.

EVIDENCE APPENDIX

Ex. A, Assignment Record

Ex. B, Iowa Secretary of State Business Record

Ex. C, Office Action, August 9, 2006

Ex. D, Rule 132 Declaration of Christopher E. Schaffer

RELATED PROCEEDINGS APPENDIX

None.



Grp./A.U.: 3753
Examiner: Craig James Price
Appeal No: